

IN THE CLAIMS

Please amend the claims as follows:

1-61. (Cancel)

62. (New) A method for reducing a rotation speed of a drive source to a rotation speed necessary for an object to be driven to thereby transfer an output torque of the drive source, said method comprising the step of providing a planetary differential gear type reduction device comprising:

an output gear affixed to an output shaft connected to the object, the output shaft extending through a hole in the output gear wherein the output gear is affixed to an outer surface of the output shaft;

a stationary gear smaller in a number of teeth than the output gear and coaxial with the output shaft, but not rotatable; and

a planetary gear rotatably mounted on a planetary gear shaft, which is driven by the torque of the drive source to revolve round the output gear and the stationary gear, and revolving round the output gear and the stationary gear in mesh with the output gear and the stationary gear;

wherein the planetary gear has a first portion and a second portion meshing with the stationary gear and the output gear, respectively, and having a same number of teeth as each other, and

at least one of the output gear, the stationary gear and the first portion and the second portion of the planetary gear comprises a profile shifted gear.

63. (New) The method as claimed in claim 62, wherein at least one of the output gear and the second portion of the planetary gear comprises a profile shifted gear, and the

profile shifted gear is shifted in a direction in which when the second portion and the output gear mesh with each other, a diameter of a intermeshing pitch circle of the output gear decreases.

64. (New) The method as claimed in claim 63, wherein at least one of the stationary gear and the first portion of the planetary gear comprises a profile shifted gear, and the profile shifted gear is shifted in a direction in which when the first portion and the stationary gear mesh with each other, a diameter of a intermeshing pitch circle of the stationary gear increases.

65. (New) The method as claimed in claim 64, wherein the planetary gear comprises a helical gear and has the first portion and the second portion each having teeth twisted in a particular direction.

66. (New) The method as claimed in claim 63, wherein the planetary gear comprises three planetary gears equally spaced from each other, and two of the three planetary gears comprise scissors gears each having the first portion and the second portion constantly biased in opposite directions to each other as to rotation.

67. (New) The method as claimed in claim 66, wherein each of the scissors gears biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-third of a torque necessary for the output shaft is transferred to the output gear.

68. (New) The method as claimed in claim 63, wherein the planetary gear comprises a single planetary gear.

69. (New) The method as claimed in claim 62, wherein at least one of the stationary gear and the first portion of the planetary gear comprises a profile shifted gear, and the profile

shifted gear is shifted in a direction in which when the first portion and the stationary gear mesh with each other, a diameter of a intermeshing pitch circle of the stationary gear increases.

70. (New) The method as claimed in claim 64, wherein the planetary gear comprises a helical gear and has the first portion and the second portion each having teeth twisted in a particular direction.

71. (New) The method as claimed in claim 62, wherein the planetary gear comprises a helical gear and has the first portion and the second portion each having teeth twisted in a particular direction.

72. (New) The method as claimed in claim 71, wherein the planetary gear comprises three planetary gears equally spaced from each other, and two of the three planetary gears comprise scissors gears each having the first portion and the second portion constantly biased in opposite directions to each other as to rotation.

73. (New) The method as claimed in claim 72, wherein each of the scissors gears biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-third of a torque necessary for the output shaft is transferred to the output gear.

74. (New) The method as claimed in claim 71, wherein the planetary gear comprises a single planetary gear.

75. (New) The method as claimed in claim 62, wherein the planetary gear comprises two planetary gears symmetrical to each other with respect to an axis of the stationary gear and the output gear.

76. (New) The method as claimed in claim 75, wherein a difference between a

number of teeth of the output gear and a number of teeth of the stationary gear is even, and the first portion and the second portion of each of the planetary gears have a same pitch as each other.

77. (New) The method as claimed in claim 75, wherein a difference between a number of teeth of the output gear and a number of teeth of the stationary gear is odd, and the first portion and the second portion of one of the planetary gears is shifted by half a pitch relative to the other of the first portion and the second portion.

78. (New) The method as claimed in claim 75, wherein one of the planetary gears comprises a scissors gear having the first portion and the second portion constantly biased in opposite directions to each other as to rotation.

79. (New) The method as claimed in claim 78, wherein the scissors gear biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-half of a torque necessary for the output shaft is transferred to the output gear.

80. (New) The method as claimed in claim 75, wherein a difference between a number of teeth of the output shaft and a number of teeth of the stationary shaft is odd, and one of the planetary gears comprises a scissors gear having the first portion and the second portion constantly biased in opposite directions to each other as to rotation and having a maximum range of rotation of 0.5 pitch.

81. (New) The method as claimed in claim 62, wherein the planetary gear comprises three planetary gears equally spaced from each other, and two of the three planetary gears comprise scissors gears each having the first portion and the second portion constantly biased in opposite directions to each other as to rotation.

82. (New) The method as claimed in claim 81, wherein each of the scissors gears biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-third of a torque necessary for the output shaft is transferred to the output gear.

83. (New) The method as claimed in claim 62, wherein the planetary gear comprises a single planetary gear.

84. (New) A method for reducing a rotation speed of a drive source to a rotation speed necessary for an object to be driven to thereby transfer an output torque of the drive source, said method comprising the step of providing a planetary differential gear type reduction device comprising:

an output gear affixed to an output shaft connected to the object;

a stationary gear smaller in a number of teeth than the output gear and coaxial with the output shaft, but not rotatable; and

a planetary gear rotatably mounted on a planetary gear shaft, which is driven by the torque of the drive source to revolve round the output gear and the stationary gear, and revolving round the output gear and the stationary gear in mesh with the output gear and the stationary gear;

wherein the planetary gear has a first portion and a second portion meshing with the stationary gear and the output gear, respectively, and having a same number of teeth as each other, and at least one of the output gear, the stationary gear and the first portion and the second portion of the planetary gear comprises a profile shifted gear,

wherein at least one of the output gear and the second portion of the planetary gear comprises a profile shifted gear, and the profile shifted gear is shifted in a direction in which

when the second portion and the output gear mesh with each other, a diameter of a intermeshing pitch circle of the output gear decreases,

wherein at least one of the stationary gear and the first portion of the planetary gear comprises a profile shifted gear, and the profile shifted gear is shifted in a direction in which when the first portion and the stationary gear mesh with each other, a diameter of a intermeshing pitch circle of the stationary gear increases,

wherein the planetary gear comprises a helical gear and has the first portion and the second portion each having teeth twisted in a particular direction,

wherein a sum of a contact ratio between the stationary gear and the planetary gear and a contact ratio of the output shaft and the planetary gear is between 1.0 and 5.0.

85. (New) The method as claimed in claim 84, wherein the planetary gear comprises two planetary gears symmetrical to each other with respect to an axis of the stationary gear and the output gear.

86. (New) The method as claimed in claim 85, wherein a difference between a number of teeth of the output gear and a number of teeth of the stationary gear is even, and the first portion and the second portion of each of the planetary gears have a same pitch as each other.

87. (New) The method as claimed in claim 85, wherein a difference between a number of teeth of the output gear and a number of teeth of the stationary gear is odd, and the first portion and the second portion of one of the planetary gears is shifted by half a pitch relative to the other of the first portion and the second portion.

88. (New) The method as claimed in claim 85, wherein one of the planetary gears comprises a scissors gear having the first portion and the second portion constantly biased in

opposite directions to each other as to rotation.

89. (New) The method as claimed in claim 88, wherein the scissors gear biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-half of a torque necessary for the output shaft is transferred to the output gear.

90. (New) The method as claimed in claim 85, wherein a difference between a number of teeth of the output shaft and a number of teeth of the stationary shaft is odd, and one of the planetary gears comprises a scissors gear having the first portion and the second portion constantly biased in opposite directions to each other as to rotation and having a maximum range of rotation of 0.5 pitch.

91. (New) The method as claimed in claim 84, wherein the planetary gear comprises three planetary gears equally spaced from each other, and two of the three planetary gears comprise scissors gears each having the first portion and the second portion constantly biased in opposite directions to each other as to rotation.

92. (New) The method as claimed in claim 91, wherein each of the scissors gears constantly biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-third of a torque necessary for the output shaft is transferred to the output gear.

93. (New) The method as claimed in claim 84, wherein the planetary gear comprises a single planetary gear.

94. (New) A method for reducing a rotation speed of a drive source to a rotation speed necessary for an object to be driven to thereby transfer an output torque of the drive source, said method comprising the step of providing a planetary differential gear type

reduction device comprising:

an output gear affixed to an output shaft connected to the object;

a stationary gear smaller in a number of teeth than the output gear and coaxial with the output shaft, but not rotatable; and

a planetary gear rotatably mounted on a planetary gear shaft, which is driven by the torque of the drive source to revolve round the output gear and the stationary gear, and revolving round the output gear and the stationary gear in mesh with the output gear and the stationary gear;

wherein the planetary gear has a first portion and a second portion meshing with the stationary gear and the output gear, respectively, and having a same number of teeth as each other, and at least one of the output gear, the stationary gear and the first portion and the second portion of the planetary gear comprises a profile shifted gear,

wherein at least one of the output gear and the second portion of the planetary gear comprises a profile shifted gear, and the profile shifted gear is shifted in a direction in which when the second portion and the output gear mesh with each other, a diameter of a intermeshing pitch circle of the output gear decreases,

wherein at least one of the stationary gear and the first portion of the planetary gear comprises a profile shifted gear, and the profile shifted gear is shifted in a direction in which when the first portion and the stationary gear mesh with each other, a diameter of a intermeshing pitch circle of the stationary gear increases,

wherein the planetary gear comprises a helical gear and has the first portion and the second portion each having teeth twisted in a particular direction,

wherein a sum of a contact ratio between the stationary gear and the planetary gear

and a contact ratio of the output shaft and the planetary gear is between 1.0 and 5.0.

95. (New) The method as claimed in claim 94, wherein the planetary gear comprises two planetary gears symmetrical to each other with respect to an axis of the stationary gear and the output gear.

96. (New) The method as claimed in claim 95, wherein a difference between a number of teeth of the output gear and a number of teeth of the stationary gear is even, and the first portion and the second portion of each of the planetary gears have a same pitch as each other.

97. (New) The method as claimed in claim 95, wherein a difference between a number of teeth of the output gear and a number of teeth of the stationary gear is odd, and the first portion and the second portion of one of the planetary gears is shifted by half a pitch relative to the other of the first portion and the second portion.

98. (New) The method as claimed in claim 95, wherein one of the planetary gears comprises a scissors gear having the first portion and the second portion constantly biased in opposite directions to each other as to rotation.

99. (New) The method as claimed in claim 98, wherein the scissors gear biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-half of a torque necessary for the output shaft is transferred to the output gear.

100. (New) The method as claimed in claim 95, wherein a difference between a number of teeth of the output shaft and a number of teeth of the stationary shaft is odd, and one of the planetary gears comprises a scissors gear having the first portion and the second portion constantly biased in opposite directions to each other as to rotation and having a

maximum range of rotation of 0.5 pitch.

101. (New) A method for reducing a rotation speed of a drive source to a rotation speed necessary for an object to be driven to thereby transfer an output torque of the drive source, said method comprising the step of providing a planetary differential gear type reduction device comprising:

an output gear affixed to an output shaft connected to the object;

a stationary gear smaller in a number of teeth than the output gear and coaxial with the output shaft, but not rotatable; and

a planetary gear rotatably mounted on a planetary gear shaft, which is driven by the torque of the drive source to revolve round the output gear and the stationary gear, and revolving round the output gear and the stationary gear in mesh with the output gear and the stationary gear;

wherein the planetary gear has a first portion and a second portion meshing with the stationary gear and the output gear, respectively, and having a same number of teeth as each other, and at least one of the output gear, the stationary gear and the first portion and the second portion of the planetary gear comprises a profile shifted gear,

wherein the planetary gear comprises a helical gear and has the first portion and the second portion each having teeth twisted in a particular direction,

wherein a sum of a contact ratio between the stationary gear and the planetary gear and a contact ratio of the output shaft and the planetary gear is between 1.0 and 5.0.

102. (New) The method as claimed in claim 101, wherein the planetary gear comprises two planetary gears symmetrical to each other with respect to an axis of the stationary gear and the output gear.

103. (New) The method as claimed in claim 102, wherein a difference between a number of teeth of the output gear and a number of teeth of the stationary gear is even, and the first portion and the second portion of each of the planetary gears have a same pitch as each other.

104. (New) The method as claimed in claim 102, wherein a difference between a number of teeth of the output gear and a number of teeth of the stationary gear is odd, and the first portion and the second portion of one of the planetary gears is shifted by half a pitch relative to the other of the first portion and the second portion.

105. (New) The method as claimed in claim 102, wherein one of the planetary gears comprises a scissors gear having the first portion and the second portion constantly biased in opposite directions to each other as to rotation.

106. (New) The method as claimed in claim 105, wherein the scissors gear biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-half of a torque necessary for the output shaft is transferred to the output gear.

107. (New) The method as claimed in claim 102, wherein a difference between a number of teeth of the output shaft and a number of teeth of the stationary shaft is odd, and one of the planetary gears comprises a scissors gear having the first portion and the second portion biased in opposite directions to each other as to rotation and having a maximum range of rotation of 0.5 pitch.

108. (New) A method for reducing a rotation speed of a drive source to a rotation speed necessary for an object to be driven to thereby transfer an output torque of the drive source, said method comprising the step of providing a planetary differential gear type

reduction device comprising:

an output gear affixed to an output shaft connected to the object;

a stationary gear smaller in a number of teeth than the output gear and coaxial with the output shaft, but not rotatable; and

a planetary gear rotatably mounted on a planetary gear shaft, which is driven by the torque of the drive source to revolve round the output gear and the stationary gear, and revolving round the output gear and the stationary gear in mesh with the output gear and the stationary gear;

wherein the planetary gear has a first portion and a second portion meshing with the stationary gear and the output gear, respectively, and having a same number of teeth as each other, and at least one of the output gear, the stationary gear and the first portion and the second portion of the planetary gear comprises a profile shifted gear,

wherein a sum of a contact ratio between the stationary gear and the planetary gear and a contact ratio of the output shaft and the planetary gear is between 1.0 and 5.0.

109. (New) The method as claimed in claim 108, wherein the planetary gear comprises two planetary gears symmetrical to each other with respect to an axis of the stationary gear and the output gear.

110. (New) The method as claimed in claim 109, wherein a difference between a number of teeth of the output gear and a number of teeth of the stationary gear is even, and the first portion and the second portion of each of the planetary gears have a same pitch as each other.

111. (New) The method as claimed in claim 109, wherein a difference between a number of teeth of the output gear and a number of teeth of the stationary gear is odd, and the

first portion and the second portion of one of the planetary gears is shifted by half a pitch relative to the other of the first portion and the second portion.

112. (New) The method as claimed in claim 109, wherein one of the planetary gears comprises a scissors gear having the first portion and the second portion constantly biased in opposite directions to each other as to rotation.

113. (New) The method as claimed in claim 112, wherein the scissors gear biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-half of a torque necessary for the output shaft is transferred to the output gear.

114. (New) The method as claimed in claim 109, wherein a difference between a number of teeth of the output shaft and a number of teeth of the stationary shaft is odd, and one of the planetary gears comprises a scissors gear having the first portion and the second portion constantly biased in opposite directions to each other as to rotation and having a maximum range of rotation of 0.5 pitch.

115. (New) The method as claimed in claim 108, wherein the planetary gear comprises three planetary gears equally spaced from each other, and two of the three planetary gears comprise scissors gears each having the first portion and the second portion constantly biased in opposite directions to each other as to rotation.

116. (New) The method as claimed in claim 115, wherein each of the scissors gears biases the first portion and the second portion in the opposite directions with a force that causes a torque corresponding to one-third of a torque necessary for the output shaft is transferred to the output gear.

117. (New) The method as claimed in claim 108, wherein the planetary gear

comprises a single planetary gear.

118. (New) A method of driving an object comprising the steps of:

outputting a preselected torque with a preselected rotation speed about a drive axis
using a drive source; and

reducing the rotation speed of the drive source to a rotation speed necessary for the
object to be driven to thereby transfer the torque of the drive source to the object;

wherein said step of reducing the rotation speed includes providing a planetary
differential gear type reducing device comprising:

an output gear affixed to an output shaft connected to the object, the output gear being
coaxial with the drive axis;

a stationary gear smaller in a number of teeth than the output gear and coaxial with
the output shaft, but not rotatable; and

a planetary gear rotatably mounted on a planetary gear shaft, which is driven by the
torque of the drive source to revolve round the output gear and the stationary gear, and
revolving round the output gear and the stationary gear in mesh with the output gear and the
stationary gear;

wherein the planetary gear has a first portion and a second portion meshing with the
stationary gear and the output gear, respectively, and having a same number of teeth as each
other, and

at least one of the output gear, the stationary gear and the first portion and the second
portion of the planetary gear comprises a profile shifted gear.

119. (New) A method of driving an object comprising the steps of:

outputting a preselected torque with a preselected rotation speed using a drive source;

and

reducing the rotation speed of the drive source to a rotation speed necessary for an object to be driven to thereby transfer the torque of the drive source to the object;

wherein said step of reducing the rotation speed includes providing a planetary differential gear type reducing device comprising:

an output gear affixed to an output shaft connected to the object;

a stationary gear smaller in a number of teeth than the output gear and coaxial with the output shaft, but not rotatable; and

a planetary gear rotatably mounted on a planetary gear shaft, which is driven by the torque of the drive source to revolve round the output gear and the stationary gear, and revolving round the output gear and the stationary gear in mesh with the output gear and the stationary gear;

wherein the planetary gear has a first portion and a second portion meshing with the stationary gear and the output gear, respectively, and having a same number of teeth as each other, and

at least one of the output gear, the stationary gear and the first portion and the second portion of the planetary gear comprises a profile shifted gear,

further comprising:

power inputting member for driving the planetary gear shaft, which is affixed to the power inputting member, such that the planetary gear revolves round the output gear and the stationary gear; and

a torque transmitting member for transmitting the torque from the drive source to the power inputting member;

wherein the stationary member and the power inputting member are rotatably mounted on the output shaft.

120. (New) The method as claimed in claim 119, wherein the drive source comprises an outer rotor type motor while the power inputting member comprises an outer rotor of the outer rotor type motor.

121. (New) The method as claimed in claim 120, wherein the output shaft is rotatable relative to a stationary gear shaft support member, which supports the stationary gear, and a stator core support member facing the support member and supporting a stator core of the outer rotor type motor, and the stationary gear, the output gear and the outer rotor type motor are sequentially arranged between the stationary gear support member and the stator core support member in this order.

122. (New) A method of driving a rotary body of an image forming apparatus at a lower rotation speed than a drive source, said method comprising the step of:

reducing the rotation speed of the drive source to a rotation speed necessary for the rotary body driven to thereby transfer the torque of the drive source to the rotary body;

wherein said step of reducing the rotation speed includes providing a planetary differential gear type reducing device comprising:

an output gear affixed to an output shaft connected to the object, the output gear being coaxial with a drive axis of the drive source;

a stationary gear smaller in a number of teeth than the output gear and coaxial with the output shaft, but not rotatable; and

a planetary gear rotatably mounted on a planetary gear shaft, which is driven by the torque of the drive source to revolve round the output gear and the stationary gear, and

revolving round the output gear and the stationary gear in mesh with the output gear and the stationary gear;

wherein the planetary gear has a first portion and a second portion meshing with the stationary gear and the output gear, respectively, and having a same number of teeth as each other, and

at least one of the output gear, the stationary gear and the first portion and the second portion of the planetary gear comprises a profile shifted gear.